

# Convergence of Nano-Bio-Info-Cogno-Socio-Humano Sciences and Technologies for societal benefit and justice

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## Abstract

The processes of globalization, diversity, migration and the growing interdependence among nations and people around the world are bringing to the agenda important issues of the day related to citizenship and social justice from different perspectives and causing a very intense debate on such topics as equality, cultural identity, language, diversity, global interdependency, migration, inclusion, human rights, constructing communities, citizenship, social justice, ability to adapt and integrate, which become a very complex problem to tackle. In fact, this situation has led to a number of important questions related to the principles of interdependence in nature and society as a holistic system demanding solutions for key societal challenges, which is only possible on the basis of the convergence of multiple knowledge and technology. Convergence is as essential to our future knowledge society as engines were to the industrial revolution. This convergence of technosciences, humanosciences and technologies allows society to answer questions and resolve problems that isolated domains cannot. This convergence will help to create a counterbalance between technosciences and humanosciences on the basis of which it is only possible to find solutions to complex scientific, social, political, moral, ethical, business and other problems as well as to create new competencies, new advanced technologies and new knowledge on this basis. As a result, all these issues should become part of the current educational policy, focusing on the need to develop a multidisciplinary approach to establish and promote new and innovative interconnections between citizenship education and and knowledgeable representation of social justice in the era of global interdependence.

*Keywords:* integrated sciences, Nano-Bio-Info-Cogno-Socio-Humano Sciences, social benefits, social responsibility

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## 1 Introduction

Citizenship education must be transformed in the 21st century due to the higher level of knowledge reached by the world societies, accelerating progress in foundational emerging technologies and creating new industries and jobs at their frontiers and interfaces, developing information exchange and interaction, improving lifelong wellness and human potential, and advancing a cognitive society. Knowledgeable citizens in a diverse democratic society should be reflective, moral, responsible and active citizens showing enough knowledge, skills, and commitment needed to change the world to make it more humane, just and democratic, hence, they should develop multicultural literacy and 'Global Citizenship Competence' in an interconnected global world [3 - 5].

The world's greatest problems do not result from people's inability to read and to write. They result from people's inability to understand different cultures, races, religions, and nations – from the inability to get along and to work together to solve the world's intractable problems such as global change of the climate, energy deficiency, continually increasing population density, epidemic diseases, poverty, racism, sexism, and war. When we teach students how to critique the injustice in the world, we should

help them to formulate possibilities for action to change the world to make it more democratic and just. Critique without hope may leave students disillusioned and without support. Support is provided by identifying the ways for successful co-existence of diverse cultures in a society with secured sustainable quality of life for all.

## 2 Convergence of Nano-Bio-Info-Cogno-Socio-Humano Sciences and Technologies

The ideas of a knowledge society and knowledge economy are interlinked with the idea of science, technology and engineering which are recognized to penetrate nearly every aspect of modern life and hold the key to solving many most vital current and future challenges of the world. The notion of the future knowledge society, which is linked with innovation, pervades science, mathematics, technology and appears over and over again, whether we look at an ancient civilization, the human body, or a comet.

The concept of a knowledge society and information society are closely conflated, but not identical. The concept of a knowledge society comprises characteristics, which relate not only to the development of information and communication technologies but also to the development of any other technologies.

The perspective of a new technological revolution and the formation of a knowledge society are associated with the convergent development of nano-bio-info-cogno-socio-humano sciences and technologies – ultimately resulting in NBICSH Society (Figure 1).

The values and ethical imperatives of modern science and technologies including information, self-organisation, integrity, security, ecology, and the formation of new priorities take place under the influence of a new – synergetic - methodology, the implementation of high technologies and social transformations under conditions of globalisation.

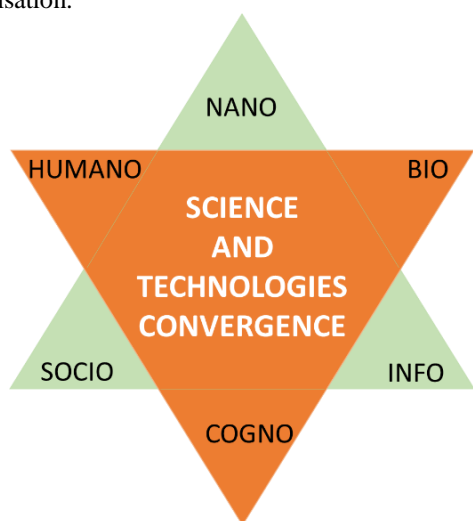


FIGURE 1 The systemic approach to Knowledge and Technologies Convergence

Information in the modern world is one of the most

powerful mechanisms, able to control public consciousness and construct various models of social behaviour. Universal commercialization of consciousness significantly limits the possibility of informatization in reinforcing mental values, among which environmental culture occupies the most important position. In humanitarian sciences there is a demand for a wider use of information technologies as a methodological foundation for the perception, comprehension and transformation of the socio-cultural and socio-natural space [1, 2].

The concept of the role of higher education in the creation of new cultural synergies to change human understanding of the world and social practice is the problem of developing an innovation culture and ‘Global Citizenship Competence’

### 3 Conclusions

Higher education should help students to develop thoughtful and knowledgeable identifications with their cultural communities, nation-states, and the global community. It also should enable them to acquire a clear understanding, attitudes, and skills needed to act to make the nation and the world more democratic and just.

Cultural, ethnic, racial, language, and religious diversity exists in most countries in the world. One of the challenges to diverse democratic nation-states is to provide opportunities for different groups to maintain aspects of their community cultures while building a nation in which these groups are structurally included and to which they feel allegiance. A delicate balance of unity and diversity should be an essential goal of citizenship education and of teaching and learning in democratic societies.

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